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NOTE ON THE BASKING SHARK.

A good-sized male example of the Basking Shark (*Centorhinus maximus*), was caught September 27, 1918, in a floating gill-net, 8-inch mesh (stretch), No. 21 twine, set in seven fathoms about a mile off point Reyes, Calif. The shark became entangled in the net and, rolling up in it, became helpless and finally drowned through pressure of gill-covers upon the gills. It gave the following measurements, in inches: Length 280 (23⅓ feet); lower jaw 29; upper jaw 30; upper lobe of caudal, outer edge (pit to tip), 59, inner 44; lower lobe, outer edge 31, inner 19; caudal peduncle from base of tail to anal fin 24; width of tail 60; of pectoral fin outside 45; dorsal fin, front 33, back 26; ventral fin, front 22, back 21; eye 2 by 1.75. Total weight 2,450 pounds; weight of tail to narrowest place of caudal peduncle 135 pounds. The liver alone weighed 385 pounds. Gill-slits 5, very long and almost meeting below; teeth very small, scarcely perceptible. The skin was very rough, the odor very strong. Under the skin along the middle of the back was a long strip of red meat about an inch thick.

The shark was captured by Girolama Pasquali who brought it in to Fisherman's Wharf, San Francisco, whence it was taken to M. M. Scheafer's fertilizer works near San Rafael, where I examined and

measured it. The weights were given me by Mr. Shaefer.

The oil extracted from the liver brought 85 cents a gallon. The amount obtained was not determined as the liver was treated with other material. The rest of the carcass, after all the oil had been extracted, was converted into poultry feed which brought $70 per ton.

This species of shark is known to the fishermen as the Capidoli, or oil fish.

A few days later (October 4) another specimen of the Basking Shark was brought in to San Francisco by Agostino Bregante. This example was taken off Bolinas Bay near San Francisco, and was 13 feet, 10 inches long. It also went into chicken feed at Schaefer's factory.

While these are not the first examples of the Basking Shark taken on the California coast, the species is of such rare occurrence anywhere that these captures are worthy of record.

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CONCERNING THE GENERIC NAME, *CRISTIVOMER* vs. *SALVELINUS*, FOR THE GREAT LAKES TROUT OR NAMAYCUSH.

The generic name for the lake trout has undergone several changes since Walbaum in 1794 designated the species as *Salmo namaycush*. After the generic name *Salvelinus* for the char had been generally recognized, the lake trout being regarded as a char, was for some time, by American authorities at least, called *Salvelinus namaycush*.

In 1878 Gill and Jordan (a) bestowed upon it the generic name, *Cristivomer*. The character which

(a) Manual of Vertebrates of the Eastern United States, ed. 2, p. 356.

distinguished the genus from *Salvelinus* was stated to be a raised crest behind the head of the vomer and free from its shaft, the crest being armed with teeth.

In 1914 C. Tate Regan, (b) of the British Museum, indicated that *Salvelinus fontinalis* possessed a backward extension of the head of the vomer, and in form and dentition was intermediate between a British char and the lake trout. For this reason he considered it advisable to give up the generic name *Cristivomer*. In the same year, in a paper (c) which was in press at the time Regan's conclusion was published, the present writer had stated a like conclusion based, however, on somewhat different characters of the vomers. He had found that some vomers of *Salvelinus stagnalis* from Labrador and *S. aureolus* from Floods Pond, Maine, could not be distinguished from the typical vomer of the lake trout, thus appearing intermediate between *S. fontinalis* and the lake trout. In the addenda to the same publication, however, attention was called to the discrepancy between Regan's and the present writer's observations, and the suggestion offered that neither char possessing lake trout-like vomers was intermediate between the lake trout and the other, but each independently derived from the ancestral form.

Apparently both Regan and the present writer thought they had discovered something new concerning char vomers, but 26 years prior to our publications F. A. Smitt (d) called attention to a similar situation, citing a specimen from Spitsbergen and one from Greenland which presented vomerine characters similar to *Cristivomer namaycush*. However, Smitt

(b) An. Mag. Nat. Hist., Ser. 8, Vol. 13, p. 403-408, April, 1914.

(c) The Fishes of New England. The salmon family, part 1; the trout or chars. Memoirs Boston Soc. Nat. Hist., Vol. 8, number 1, July, 1914.

(d) Kritisk Förteckning öfver de i Riksmuseum befintliga Salmonider. Kongl. Svensk. Vetenskaps—akademens handlinger, 21, No. 8, Stockholm, 1886, p. 145.

did not recognize even the genus *Salvelinus*. In fact his genus *Salmo* was the same as the sub-family *Salmoninae* of most recent ichthyologists.

Inasmuch as the *Cristivomer* form of vomer is exceptional rather than the rule in the other chars, they may be regarded as vestigeal. However, the fact remains that the genera can not always be distinguished by the character of the vomer.

The present writer has long been convinced that the lake trout represents a line of development distinct from the other chars, whether it could be taxonomically recognized or not. A recent examination of the skulls of various species of salmon, trout and chars revealed a character which sharply defines the lake trout from all other salmoninae. This character is in the form of the ethmoid bone (called mesethmoid by Regan). In the lake trout this bone is relatively tively long and slender; the striae nearly parallel, its width measured between the extremities of the middle vertical diameter of the nasal fossae, in 3 specimens, constituting respectively 20.9, 21.6 and 29.05 per cent of the length of the ethmoid bone. In the specimens of other species examined the ethmoid is relatively short and fan-shaped, the striae radiating toward the orbits to join with the striae of the frontal bones. The width in the same location as in the lake trout constituted the following per cent of their lengths, respectively: *S. fontinalis*, 38.4; 45.45; 54.3; *S. stagnalis*, 42.1 and 48.2 (male) and 48.7 (female); *Salvelinus kundsba*, 60.0, 64.2, 67.7, 79.0. As the character of the vomer distinguishes the lake trout from all other genera than *Salvelinus*, it is unnecessary to present the details of measurements of *Salmo*, *Oncorhynchus*, etc.

The ethmoid character taken in connection with various other lesser differences surely must be regarded as sufficient to reëstablish the genus *Cristivomer*. The character of the lake trout ethmoid is associated

with a comparately narrow interorbital space; the frontal area is flat, and in one instance just in front of the orbits the surface of the skull is shallowly concave. In all other species examined there was no instance of a flat or concave skull as in the lake trout, and in most instances there is a median longitudinal ridge at the juction of the frontal bones, particularly in the larger specimens.

The narrow and relatively long ethmoid gives the contracted or pinched appearance of the snout as noticeable in the lake trout. As a rule the shape of the head and appearance of the snout affords a good recognition character in larger specimens, at least.

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THE TOADS AND FROGS OF MONROE AND WAYNE COUNTIES, N. Y.

1. *Scaphiopus holbrookii holbrookii* (Harlan). Spadefoot. Prof. Chas. Wright Dodge of Univ. of Rochester told me of a record of this species from Wayne county. The material was seen by him and taken by one of the collectors of Ward's Establishment.

2. *Bufo americanus* Holbrook. American Toad. Common. March 25—Oct. 15. Eggs April 10—July 1.

3. *Pseudacris feriarum* (Baird). Swamp Cricket Frog. Peeper. Spring Peeper. Common. March 20—Oct. 1. The "Spring peeper" chorus is more likely to be this form than of *Hyla crucifer*. Eggs laid March 20—April 20. Transformation last of June.

4. *Hyla crucifer* Wied. Peeper. Pickering's Tree Frog. Quite common. March 25—Oct. 15. In this region, often the spring peepers are considered this

species but as frequently they are the above species, *P. feriarum*. The later choruses of late April and early May are more likely to be of *Hyla crucifer*. Egg-laying may begin in early April but usually comes from April 15—May 15. Transformation from July 8 onward. In fall from Sept. 1 they may be heard in the wooded areas or about the bays of Lake Ontario.

5. *Hyla versicolor* LeConte. Tree Toad. Common. May 1—Oct. 15. Eggs laid last of May—July 1. Begins croaking again Aug. 25—Oct. 1, quite commonly from Sept. 5—25. Transformation Aug. 1 onward.

6. *Rana catesbeiana* Shaw. Bullfrog. Common in swamps, marshy creeks and about the bays of Lake Ontario April 25—Oct. 15. Eggs June 20—July 20. Transformation middle of July onwards.

7. *Rana clamitans* Latreille. Green Frog. Common along swamp creeks and about the bays of Lake Ontario March 25—Oct. 15. Croaking becomes common last of June and first of July. Eggs June 1—Aug. 1. Transformation June 25 through the summer. Many of the former Rochester market froggers used to catch them and meadow-frogs in quantity about the bays and up Buttonwood and North Creeks.

8. *Rana palustris* LeConte. Pickerel-frog. Not common in the area north of the Ridge Road. Not uncommon in the hilly southern portions of Monroe in clear streams and bodies of water like Mendon ponds or in southern Wayne County at Junius, N. Y., March 25—Oct. 15. Eggs laid from April 20—May 20. Transformation July 20 onwards.

9. *Rana pipiens* Schreber. Leopard-frog. "Spotted Frog." Abundant. March 15—Oct. 15. Eggs March 25—May 1. Transformation June 26 onwards. Croaking intermittently from Aug. 20 to hibernation time.

10. *Rana sylvatica* LeConte. Wood-frog. Common. March 25—Oct. 15. Eggs Mar. 15—Apr. 25. Transformation June 25 onwards.

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A NOTE ON THE DEVELOPMENT OF *PSEUDACRIS FERIARUM* (BAIRD).

The following notes, taken during the spring and summer of 1919 show a remarkably rapid development for one of the Anura. The pools mentioned were completely exposed to the sun. They were never large and when the young frogs were emerging thirty-six days after the first eggs were found, they were nearly dry. It is possible that this may have hastened metamorphosis to some extent.

May 17, 1919, Fort Sheridan, Ill. Found *Pseudacris feriarum* breeding in trenches on the Rifle Range and collected a couple of egg clusters. The eggs are attached to grass stems arranged in a layer one or two eggs thick all around the stem, forming a mass about two inches long and less than half an inch in diameter.

May 18. Collected a breeding pair in a roadside ditch near camp.

June 22. Tadpoles of this species are metamorphosing in the same pools on the Rifle Range where eggs were found on May 17. They were in all stages of development, from tadpoles two-thirds grown, with short hind legs, to young frogs with tails nearly absorbed. The measurements of several specimens follow:

Two full-grown tadpoles with short hind legs meauseured 26 and 26.5 mm. Four with large hind legs and fore-legs almost ready to burst out; 25.5, 27, 27.5 and 28 mm. Four young frogs with all four legs well developed and tails in different stages of

absorption measured 10, 10, 10 and 11 mm. in body length.

These meausurements show that the frogs were small at metamorphosis, but I do not think remarkably so compared with such species as *Hyla crucifer* and *Bufo americanus*, both of which require a longer time for development.

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